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GROUP 110

Applicants: J.G. BEDNORZ ET AL. : Date: March 21, 1988

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Group Art Unit: 115 : Examiner: Dennis Albrecht

FOR: NEW SUPERCONDUCTIVE COMPOUNDS HAVING HIGH TRANSITION TEMPERATURE, AND METHODS FOR THEIR USE AND PREPARATION

DECLARATION OF J. GEORG BEDNORZ AND K.A. MUELLER WITH RESPECT TO HIGH Tc SUPERCONDUCTIVITY

Commissioner of Patents and Trademarks
Washington, D. C. 20231

Sir:

We, J. Georg Bednorz and K.A. Mueller, hereinafter say and declare the following:

1. We are the inventors of the contribution described and claimed in the subject U.S. patent application. This application describes our earlier discovery of high temperature superconductivity in ceramic copper oxide materials. In particular, one of the earlier systems in which we worked was comprised of Ba-La-Cu-oxides which exhibited superconducting onset temperatures in the mid to upper thirty K range.

2. We conducted extensive research on these materials to establish their superconductivity in our laboratory in Zurich, Switzer- land. This work traced back to early 1986 and was described in a publication by us that appeared in Z. Phys. B - Condensed Matter 64, 189-193 (1986). This article describes, among other items, resistivity versus temperature measurements that we made on samples of this material to show its superconductive behavior. We subsequently submitted for publication and had published additional articles describing these high Tc oxide superconductors.

3. On approximately October 16, 1986, we gave Praveen Chaudhari (Vice-President, Science at the Yorktown Research Laboratory of IBM Corporation) six samples of the high temperature superconductive ceramic oxide material that we had described in our aforementioned Z. Physik B. publication. Praveen Chaudhari brought these samples back to the U.S. when he returned after

visiting with us on or about October 16, 1986. These samples were given to him so that experimentation and measurement could be performed on the samples in the United States. We knew the individuals (Richard Greene and Chang C. Tsuei) who would be involved in the measurements in the United States and discussed the measurements with these individuals in approximately the third week of October, 1986. We maintained telephone and computer communications with these individuals from that time continually through the remainder of 1986 and into 1987.

4. It was decided by us that Richard Greene would do specific heat measurements on these samples while magnetic measurements would be done by us in our Zurich laboratory. Greene worked for Chang Tsuei and discussed with him the nature of the experiments and development activi- ties to be performed at the aforementioned Yorktown lab. We provided guidance to Richard Greene and Chang Tsuei by describing the nature of these superconducting samples and the types of properties that we had measured relative to these samples. One of us (K.A. Mueller) also discussed confirmation of our resistivity versus temperature measurements with said Chang Tsuei in a telephone converation in October, 1986.

5. The early work conducted by the individuals in the Yorktown laboratory on our superconducting samples occurred with the supervision and guidance that we furnished to these Yorktown scientists. Addition-ally, we provided a preprint to Richard Greene of an article that we subsequently published in Europhysics Letters 3, (3), pp. 379-385 (1987). This article was given to Greene in October, 1986 and described magnetic measurements on these superconducting samples.

6. We were aware of the work being conducted on our samples at the Yorktown lab and were in contact with the individuals there, and particularly Richard Greene, who reported to Chang Tsuei. Since the specif-ic heat measurements generally take longer, we had considerable interac-tions with Rick Green over a period of time from about October 22, 1986 through December, 1986, concerning his specific heat measurements. We also were made aware of Chang Tsuei's measurements of resistivity versus temperature of the Ba-La-Cu-oxide samples, which confirmed our earlier resistivity versus temperature measurements.

7. We further declare that all statements made hereinabove based on our own knowledge are true and that all statements made on information and belief are believed to be true. We further declare

that these statements are made with the knowledge that willful false state- ments and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of our Patent Application or any patent issuing thereon.

J. Georg Bednorz DATE: May 30. 1988

J. GEORG BEDNORZ

K. Alex Müller

K.A. MUELLER DATE: May 27. 1988